MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

SRM Number: 2900
MSDS Number: 2900
SRM Name: Ethanol-Water Solution (nominal 95.6 % by mass)

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Description: Standard Reference Material (SRM) 2900 is a solution of ethanol in water at a nominal concentration of 95.6 % by mass. SRM 2900 consists of five 10-milliliter ampoules, each containing approximately 10 mL of solution.

Substance: Ethanol-Water Solution (nominal 95.6 % by mass)

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS[1]

Component:	**Ethanol**
Other Designations:	**Ethanol** (ethyl alcohol; ethyl hydroxide; ethyl hydrate; methyl carbinol; absolute alcohol; fermentation alcohol)
CAS Number:	64-17-5
EC Number (EINECS):	200-578-6
SRM Nominal Concentration (mass %):	95.6
EC Classification:	F
EC Risk (R No.):	11
EC Safety (S No.):	2, 7, 16

[1.] Hazardous components 1 % or greater; Carcinogens 0.1 % or greater are listed in compliance with OSHA 29 CFR 1910.1200.

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0–4): Health = 2 Fire = 3 Reactivity = 0

Major Health Hazards: Respiratory tract irritation. Skin irritation. Eye irritation. Central nervous system depression. Liver damage.

Potential Health Effects

Inhalation: Exposure to ethanol of 1 000 ppm to 10 000 ppm may cause temporary irritation of the upper respiratory tract, coughing, and central nervous system depression. Symptoms may include headache, fatigue, dizziness, drowsiness, dullness, lassitude, and loss of appetite. Repeated or prolonged exposure by inhalation may cause irritation of the mucous membranes, headache, dizziness, nervousness, fatigue, nausea, lack of concentration, and sleepiness.

Skin Contact: Acute exposure of ethanol to the skin may cause mild redness and burning. May occasionally cause allergic contact dermatitis. Repeated or prolonged contact with ethanol, the liquid, can cause dermatitis.

Eye Contact: Vapor concentrations of ethanol of 1 000 ppm to 10 000 ppm may cause temporary eye irritation. Direct contact of the liquid may cause immediate burning and stinging. Repeated or prolonged contact may cause conjunctivitis.

Ingestion: Ingestion may cause emotional lability and decreased inhibitions with symptoms of drunkenness. Death may occur from respiratory or circulatory failure or later from aspiration pneumonitis or pulmonary edema. Repeated or prolonged exposure may cause damage to the liver, kidneys, and brain. The heart may also be affected.

Listed as a Carcinogen/ Potential Carcinogen: **Ethanol**

Yes	No	
	X	In the National Toxicology Program (NTP) Report on Carcinogens.
	X	In the International Agency for Research on Cancer (IARC) Monographs.
	X	By the Occupational Safety and Health Administration (OSHA).

4. FIRST AID MEASURES

Inhalation: If adverse effects occur, remove to uncontaminated area. Give artificial respiration, if not breathing, by qualified personnel. Get immediate medical attention.

Skin Contact: Rinse affected area with copious amounts of water for at least 15 minutes while removing contaminated clothing. Get medical attention, if needed.

Eye Contact: Flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Get immediate medical attention.

Ingestion: Get immediate medical attention. If vomiting occurs, keep head lower than hips to prevent aspiration. Give artificial respiration, if not breathing, by qualified personnel.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Ethanol is a severe fire hazard. The vapor is heavier than air and may ignite by a distant ignition source and flash back. Vapor/air mixtures are explosive above the flash point.

Extinguishing Media: Alcohol resistant foam. Carbon dioxide. Regular dry chemical. Water.

Fire Fighting: Move container from fire area if it can be done without risk. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Component: **Ethanol (nominal 95.6 %)**
Flash Point: 17 °C (63 °F)
Method Used: Closed Cup (CC).

Autoignition Temp.: 363 °C (ethanol)

Flammability Limits in Air
UPPER (Volume %): 19 (ethanol)
LOWER (Volume %): 3.3 (ethanol)

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Avoid hear, flames, sparks, and other sources of ignition. Remove sources of ignition. Reduce vapors with water spray. Absorb small, spilled material volumes with sand or other non-combustible material. Collect spilled material in an appropriate container for disposal.

Disposal: Refer to Section 13, "Disposal Considerations".

7. HANDLING AND STORAGE

Storage: Store and handle in accordance with all current regulations and standards.

Safe Handling Precautions: See Section 8, "Exposure Controls and Personal Protection".

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits: **Ethanol**

OSHA (PEL): 1 900 mg/m^3 (1 000 ppm) TWA
ACGIH: 1 900 mg/m^3 (1 000 ppm) TWA
NIOSH: 1 900 mg/m^3 (1 000 ppm) recommended TWA (10 h)
WEL UK: 1 920 mg/m^3 (1 000 ppm) TWA

Ventilation: Provide local exhaust ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present.

Respirator: If necessary, refer to the "NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84" for selection and use of respirators certified by NIOSH.

Eye Protection: Wear safety goggles. An eye wash station should be readily available near areas of use.

Personal Protection: Wear appropriate protective clothing and chemically resistant gloves to prevent skin exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

Component: **Ethanol (nominal 95.6 % by mass)**
Appearance and Odor: Liquid. Colorless. Fruity odor.
Boiling Point: 78 °C (172 °F)
Vapor Density (air = 1): 1.6
Water Solubility: Soluble.
Solvent Solubility: Soluble in benzene, ether, and acetone.

10. STABILITY AND REACTIVITY

Stability: X Stable _____ Unstable

Stable at normal temperatures and pressure.

Conditions to Avoid: Avoid heat, flames, sparks, and other sources of ignition. Avoid contact with incompatible material.

Incompatible Materials: Halo carbons. Metals. Metal salts. Oxidizing materials. Halogens. Peroxides. Acids. Metal oxides. Bases. Combustible materials.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Thermal decomposition will produce oxides of carbon.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: X Inhalation X Skin X Ingestion

Toxicity Data: **Ethanol**
Man, Intermittent Oral TD_{LO}: 22 500 mg/kg (4 weeks)
Man, Oral TD_{LO}: 3 371 µL/kg
Man, Oral TD_{LO}: 1 430 µg/kg
Man, Oral TD_{LO}: 50 mg/kg

Tumorigenic, Reproductive, Mutagenic Data: Ethanol has been investigated as a tumorigenic, mutagenic, and reproductive effector.

Health Effects (Acute and Chronic): See Section 3: "Hazards Identification" for potential health effects.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data Summary: Highly toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Ethanol, UN Number 1170, Hazard Class 3, Packing Group II, Excepted quantity (5 × 10 mL).

15. REGULATORY INFORMATION

U.S. Regulations: CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE:	Yes.
CHRONIC:	Yes.
FIRE:	Yes.
REACTIVE:	No.
SUDDEN RELEASE:	No.

State Regulations: California Proposition 65: Not regulated.

CANADIAN Regulations

WHMIS Classification: Not determined.

EUROPEAN Regulations

EC Classification (assigned):	F	Highly flammable.
EC Risk Phrases:	R11	Highly flammable.
EC Safety Phrases:	S2	Keep out of reach of children.
	S7	Keep container tightly closed.
	S16	Keep away from sources of ignition. No smoking.

National Inventory Status

U.S. Inventory (TSCA):	Ethanol:	Listed on inventory.

TSCA 12(b)

Export Notification:	Ethanol:	Not listed.

16. OTHER INFORMATION

Sources: MDL Information Systems, Inc., MSDS *Ethyl Alcohol, 96 %*, 08 December 2005.